

Application No.: 10/576,065
312 Amendment Dated: August 31, 2009
Reply to Notice of: July 17, 2009

MAT-8843US

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.-108. (Cancelled).

109. (Previously Presented) A communication system comprising:
a first information processor;
a second information processor;
a first communication control unit for controlling the communication of the first information processor;
a server; and
a second communication control unit for controlling the communication of the second information processor,

wherein the first information processor includes:

a bubble packet transmitter for transmitting a bubble packet for leaving transmission record in the first communication control unit to the second communication control unit via the first communication control unit;

a reply packet receiver for receiving a reply packet transmitted from the second information processor via the second communication control unit to a bubble packet transmitting port, a port of the first communication control unit, which is used in transmission of the bubble packet;

a range detection packet transmitter for transmitting a range detection packet used for detecting a range of ports including the bubble packet transmitting port to the server, and

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a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting a port number differential in the first communication control unit to the server via the first communication control unit,

the server includes:

a range detector which receives the range detection packet for detecting the range of ports including the bubble packet transmitting port in accordance with the range detection packet;

a range transmitter for transmitting range information detected by the range detector as information showing the range of ports including the bubble packet transmitting port to the second information processor,

a port number differential detector which receives the port number differential detection packet for detecting a port number differential in the first communication control unit in accordance with the port number differential detection packet; and

a port number differential information transmitter for transmitting port number differential information detected by the port number differential detector as information showing the port number differential of the first communication control unit to the second information processor,

the second information processor includes:

a reply packet transmitter for transmitting the reply packet to one or more ports including at least the bubble packet transmitting port;

a range receiver for receiving the range information; and

a port number differential information receiver for receiving the port number differential information, and

wherein the reply packet transmitter transmits the reply packet to ports in a range indicated by the range information; and

the reply packet transmitter transmits the reply packet every port number differential indicated by the port number differential information.

110.-111. (Cancelled).

112. (Currently Amended) A communication system comprising:

a first information processor;

a second information processor;

a server;

a first communication control unit for controlling the communication of the first information processor; and

a second communication control unit for controlling the communication of the second information processor,

wherein the first information processor includes:

a bubble packet transmitter for transmitting a bubble packet for leaving transmission record in the first communication control unit to the second communication control unit via the first communication control unit, and

a reply packet receiver for receiving a reply packet transmitted from the second information processor via the second communication control unit to a bubble packet transmitting port, a port of the first communication control unit, which is used in transmission of the bubble packet,

a range detection packet transmitter for transmitting a range detection packet used for detecting a range of ports including the bubble packet transmitting port to the server;

a detection port information receiver for receiving detection port information showing a port position of the first communication control unit through which the range detection packet has passed;

a range detector for detecting the range of ports including the bubble packet transmitting port in accordance with detection port information received by the detection port information receiver;

a range transmitter for transmitting range information detected by the range detector as information showing the range of ports including the bubble transmitting port,

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting a port number differential in the first communication control unit to the server via the first communication control unit;

a port differential information detector port information receiver for receiving port differential information detector port information showing the port position of the first communication control unit through which the port number differential detection packet has passed;

a port number differential detector for detecting the port number differential in the first communication control unit in accordance with port differential information detector port information received by the port differential information detector port information receiver; and

a port number differential information transmitter for transmitting port number differential information detected by the port number differential detector as information showing the port number differential of the first communication control unit to the second information processor via the server,

the server includes:

a detection port detector which receives the range detection packet for detecting the port position of the first communication control unit through which the range detection packet has passed;

a detection port information transmitter for transmitting detection port information showing the port position detected by the detection port detector to the first information processor;

a port differential information detector port detector which receives the port number differential detection packet for detecting the port position of the first communication control unit through which the port number differential detection packet has passed in accordance with the port number differential detection packet; and

a port differential information detector port information transmitter for transmitting port differential information detector port information showing the port position detected by the port differential information detector port detector to the first information processor,

the second information processor includes:

a reply packet transmitter for transmitting the reply packet to one or more ports including at least the bubble packet transmitting port;

a range receiver for receiving the range information; and

a port number differential information receiver for receiving the port number differential information,

wherein the reply packet transmitter transmits the reply packet to ports in the range indicated by the range information, and

the reply packet transmitter transmits the reply packet every port number differential indicated by the port number differential information.

113.-120. (Cancelled).

121. (Previously Presented) A first information processor communicating with a second information processor via a first communication control unit for controlling the communication of the first information processor and a second

communication control unit for controlling the communication of the second information processor, the first information processor comprising:

a bubble packet transmitter for transmitting a bubble packet for leaving transmission record in the first communication control unit to the second communication control unit via the first communication control unit;

a range detection packet transmitter for transmitting a range detection packet used for detecting a range of ports including a bubble packet transmitting port;

a reply packet receiver for receiving a reply packet transmitted from the second information processor via the second communication control unit to the bubble packet transmitting port, a port of the first communication control unit, which is used in transmission of the bubble packet; and

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting a port number differential in the first communication control unit to a server via the first communication control unit.

122. (Cancelled).

123. (Previously Presented) A first information processor communicating with a second information processor via a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor, the first information processor comprising:

a bubble packet transmitter for transmitting a bubble packet for leaving transmission record in the first communication control unit to the second communication control unit via the first communication control unit;

a range detection packet transmitter for transmitting a range detection packet used for detecting a range of ports including a bubble packet transmitting port;

a reply packet receiver for receiving a reply packet transmitted from the second information processor via the second communication control unit to the bubble packet

transmitting port, a port of the first communication control unit, which is used in transmission of the bubble packet;

a port number differential detection packet transmitter for transmitting a port number differential detection packet for detecting a port number differential in the first communication control unit to a server via the first communication control unit;

a port differential information detector port information receiver for receiving port differential information detector port information showing a port position of the first communication control unit through which the port number differential detection packet has passed;

a port number differential detector for detecting the port number differential in the first communication control unit in accordance with port differential information detector port information received by the port differential information detector port information receiver; and

a port number differential information transmitter for transmitting port number differential information detected by the port number differential detector as information showing the port number differential of the first communication control unit to the second information processor via the server.

124.-132. (Cancelled).

133. (Currently Amended) A first information processor communicating with a second information processor via a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor,

wherein a bubble packet for leaving communication record in the second communication control unit is transmitted from the second information processor to the first communication control unit via the second communication control unit, the first information processor comprising:

a reply packet transmitter for transmitting a reply packet to one or more ports including at least a port of the second communication control unit used in transmission of the bubble packet from the second information processor;

a port number differential information receiver for receiving port number differential information showing the porta port number differential for transmitting the reply packet, and

a range receiver for receiving range information showing a range of ports for transmitting the reply packet,

wherein the reply packet transmitter transmits the reply packet to ports in the range indicated by the range information, and

the reply packet transmitter transmits the reply packet every port number differential indicated by the port number differential information.

134. (Previously Presented) A first information processor communicating with a second information processor via a first communication control unit for controlling the communication of the first information processor and a second communication control unit for controlling the communication of the second information processor,

wherein a bubble packet for leaving communication record in the second communication control unit is transmitted from the second information processor to the first communication control unit via the second communication control unit, first information processor comprising:

a reply packet transmitter for transmitting a reply packet to one or more ports including at least a port of the second communication control unit used in transmission of the bubble packet from the second information processor; and

a port number differential information receiver for receiving port number differential information showing a port number differential for transmitting the reply packet,

wherein the reply packet transmitter transmits the reply packet every port number differential indicated by the port number differential information.

135.-136. (Cancelled).

137. (Previously Presented) A communication method used in an information processor of a communication system, the communication system including an information processor, a communication control unit for controlling a communication of the information processor, and a server, the method comprising the steps of:

a bubble packet transmitting step for transmitting a bubble packet for leaving transmission record in the communication control unit via the communication control unit;

a range detection packet transmitting step for transmitting a range detection packet used for detecting a range of ports including a bubble packet transmitting port;

a reply packet receiving step for receiving a reply packet transmitted to one or more ports including at least the bubble packet transmitting port; and

a port number differential detection packet transmitting step for transmitting a port number differential detection packet for detecting a port number differential in the communication control unit to the server via the communication control unit.

138.-139. (Cancelled).

140. (Previously Presented) A communication method used in an information processor of a communication system, the communication system including an information processor, a communication control unit for controlling a communication of the information processor, and a server, the method comprising the steps of:

a bubble packet transmitting step for transmitting a bubble packet for leaving transmission record in the communication control unit via the communication control unit;

a range detection packet transmitting step for transmitting a range detection packet used for detecting a range of ports including a bubble packet transmitting port;

a reply packet receiving step for receiving a reply packet transmitted to one or more ports including at least the bubble packet transmitting port; and

a port number differential detection packet transmitting step for transmitting a port number differential detection packet for detecting a port number differential in the communication control unit to the server via the communication control unit;

a detection port information receiving step for receiving detection port information showing a port position of the communication control unit through which the range detection packet has passed;

a range detecting step for detecting the range of ports including the bubble packet transmitting port in accordance with detection port information received by the detection port information receiving step; and

a range transmitting step for transmitting range information detected by the range detecting step as information showing the range of ports including the bubble packet transmitting port.

141. (Previously Presented) A communication method used in an information processor of a communication system, the communication system including an information processor, a communication control unit for controlling the communication of the information processor, and a server, the method comprising the steps of:

a bubble packet transmitting step for transmitting a bubble packet for leaving transmission record in the communication control unit via the communication control unit;

a range detection packet transmitting step for transmitting a range detection packet used for detecting a range of ports including a bubble packet transmitting port;

a reply packet receiving step for receiving a reply packet transmitted to one or more ports including at least the bubble packet transmitting port;

a port number differential detection packet transmitting step for transmitting a port number differential detection packet for detecting a port number differential in the communication control unit to the server via the communication control unit;

a port differential information detector port information receiving step for receiving port differential information detector port information showing a port position of the communication control unit through which the port number differential detection packet has passed;

a port number differential detecting step for detecting the port number differential in the communication control unit in accordance with port differential information detector port information received by the port differential information detector port information receiving step; and

a port number differential transmitting step for transmitting port number differential information detected by the port number differential detecting step as information showing the port number differential of the communication control unit via the server.

142.-144. (Cancelled).

145. (Previously Presented) A communication method used in a second information processor of a communication system, the communication system including a first information processor, a communication control unit for controlling the communication of the first information processor, a second information processor, and a second communication control unit for controlling the communication of the second information processor,

wherein a bubble packet for leaving communication record in the second communication control unit is transmitted from the second information processor to the first communication control unit via the second communication control unit, the method comprising the steps of:

a reply packet transmitting step for transmitting a reply packet to one or more ports including at least a port of the second communication control unit used in transmission of the bubble packet from the second information processor;

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a range receiving step for receiving range information showing a port range for transmitting the reply packet; and

a port number differential receiving step for receiving port number differential information showing a port number differential for transmitting the reply packet,

wherein the reply packet is transmitted to ports in the range indicated by the range information in the reply packet transmitting step, and

the reply packet is transmitted every port number differential indicated by the port number differential information in the reply packet transmitting step.

146.-154. (Cancelled).

155. (Currently Amended) A communication system comprising:

a first information processor,

a second information processor,

a first communication control unit for controlling the communication of the first information processor,

a second communication control unit for controlling the communication of the second information processor, and

a server for establishing communication between the first information processor and the second information processor,

wherein the first information processor includes:

a bubble packet transmitter for transmitting a bubble packet, for leaving transmission record in the first communication control unit, to the second communication control unit via the first communication control unit;

a range detection packet transmitter for transmitting a range detection packet to the server after the transmission of the bubble packet, the range detection packet being used for detecting a range of ports including a bubble packet transmitting port,

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the bubble packet transmitting port being a port of the first communication control unit and used for transmission of the bubble packet;

a reply packet receiver for receiving a reply packet transmitted from the second information processor via the second communication control unit to the bubble packet transmitting port, and

wherein a port position of the first communication control unit used in transmission of the range detection packet is different from a position of the bubble packet transmitting port, and

the server includes:

a range detector which receives the range detection packet for detecting the range having an upper limit or a lower limit, of a plurality of ports including the bubble packet transmitting port in accordance with the range detection packet;

a range transmitter for transmitting range information, detected by the range detector as information showing the range, to the second information processor, and

the second information processor includes:

a range receiver for receiving the range information;

a reply packet transmitter for transmitting the reply packet to at least one or more ports including the bubble packet transmitting port, and

wherein the reply packet transmitter transmits the reply packet to ports in the range indicated by the range information.

156. (Previously Presented) The communication system of claim 155,

wherein the range detection packet transmitter of the first information processor further transmits the range detection packet before transmission of the bubble packet,

the server receives the range detection packet transmitted before and after transmission of the bubble packet,

the range detector detects the range of ports including the bubble packet transmitting port in accordance with the range detection packet, and

the range transmitter transmits range information detected by the range detector as information showing the range of ports including the bubble packet transmitting port to the second information processor.

157. (Previously Presented) A communication method used in a second information processor of a communication system, the communication system including a first information processor, a second information processor, a first communication control unit for controlling the communication of the first information processor, a second communication control unit for controlling the communication of the second information processor, and a server for establishing communication between the first information processor and the second information processor, the method comprising the steps of:

a bubble packet transmitting step of transmitting a bubble packet to the second communication control unit via a bubble packet transmitting port of the first communication control unit, the bubble packet being used for leaving transmission record in the first communication control unit;

a range detection packet transmitting step of transmitting a range detection packet to the server via a range detection transmitting port, having a position different than the position of the bubble packet transmitting port, after the transmission of the bubble packet, the range detection packet for detecting a range of ports including the bubble packet transmitting port;

a reply packet receiving step of receiving a reply packet transmitted from the second information processor via the second communication control unit to the bubble packet transmitting port;

a range detector receiving step of receiving, at the server, the range detection packet for detecting the range, having an upper limit or a lower limit, of a plurality of

ports including the bubble packet transmitting port in accordance with the range detection packet;

a range transmitting step for transmitting range information, detected by the range detector receiving step as information showing the range, from the server to the second information processor;

a range receiving step of receiving the range information at the second information processor; and

a reply packet transmitting step of transmitting the reply packet from the second information processor to at least one or more ports in the range indicated by the range information, including the bubble packet transmitting port.

158. (Previously Presented) The communication method of claim 157, further comprising the steps of:

transmitting, by the range detection packet transmitting step, the range detection packet before transmission of the bubble packet,

receiving, at the server, the range detection packet transmitted before and after transmission of the bubble packet,

detecting, by the range detector receiving step, the range of ports including the bubble packet transmitting port in accordance with the range detection packet, and

transmitting, by the range transmitting step, range information detected by the range detector receiving step as information showing the range of ports including the bubble packet transmitting port to the second information processor.